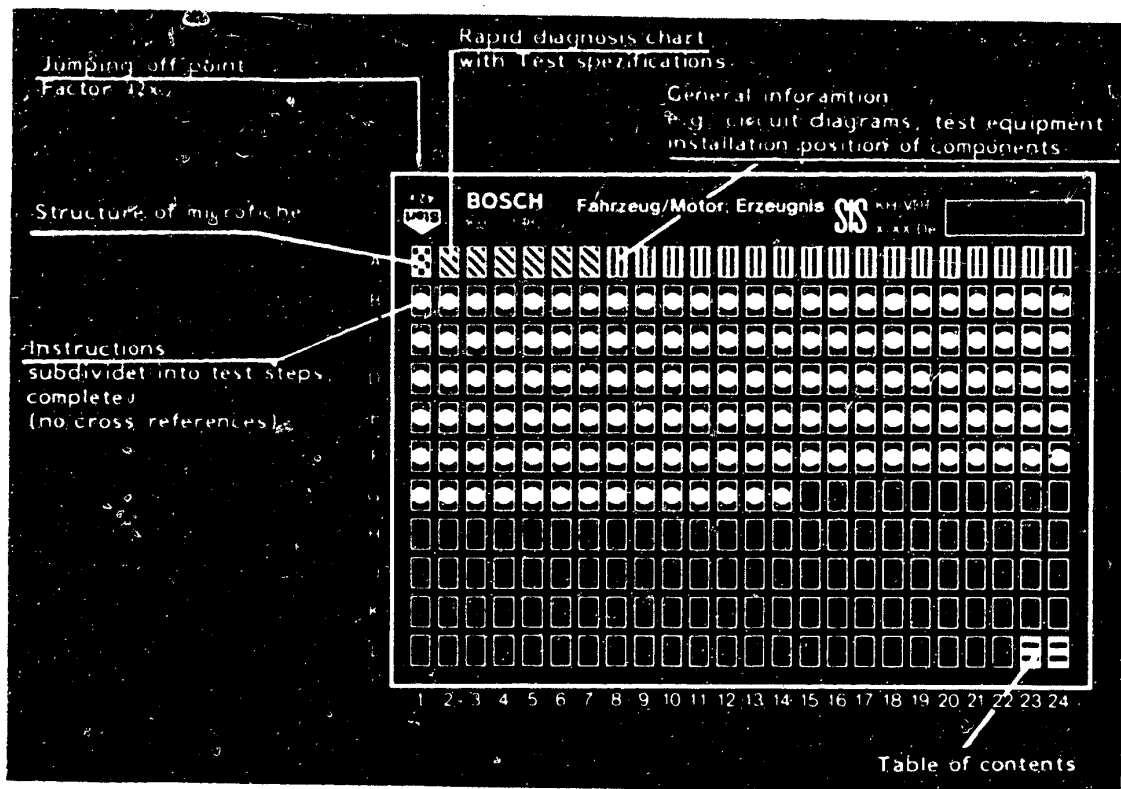


Structure of microfiche



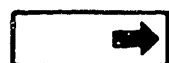
1. Read from left to right

2. Title of microfiche (appears on each coordinate)

E16	Product/assembly/test step	
	Vehicle/engine	

Coordinate

3. Limits of section



Beginning



Mid-section



End



One-page section

4. References to relevant test steps in test specifications; coordinate e.g. C6

C6

A1

Trouble-shooting program



1. Rapid test chart for heating and air-conditioning test adapter



The following rapid test chart makes it possible for the experienced expert to quickly check the system with the test adapter KDHK 0001.

The contents of this chart are limited to the following:

- Sequence of test steps
- Switch position on adapter
- Test instructions and test specifications (readings on adapter)
- References to coordinates of the respective detailed testing and trouble-shooting program.

If detailed information and instructions are required, always proceed in accordance with the trouble-shooting program starting on Coordinate B 1. ▾



Test conditions

- Check the customer complaints (check operation of automatic air conditioner in accordance with vehicle owner manual)
- Coolant level O.K.
- Refrigerant level O.K.
- Engine running and at normal operating temperature
- Electrical system (fuses, battery voltage) O.K.
- Blower-motor switch at position  /blower running
 ↳ at max. speed.
- Temperature selector thumbwheel approximately in center position (22)
- Push-button switch on vehicle in position 
- Center nozzles mechanically open

The ignition must be off when removing plug connectors.



Rapid test chart for electronic automatic air conditioner
Test adapter KDHK 0001 with adapter lead KDHK 0005

Test step	Rotary switch position	Test of	Test instructions	Reading/test specifications	Coordinate
1	1	Electronic control unit power supply		10...15	B 3
2	2	Passenger-compartment temperature sensor		5...11	B 7
2.1			Spray refrigerant spray into passenger-compartment temperature sensor	Falling during cooling down	B 9
2.2			With blower operating, check flow of air to passenger-compartment temperature sensor (with strip of paper)		B 11
3	3	Temperature selector thumbwheel	Turn the temperature selector thumbwheel from one end position to the other. Reading must change uniformly between min. and max. After testing, return temperature selector thumbwheel to center position (22).	Approx. 1.5...8 Min. approx. 1 Max. approx. 9	B 13
4	4	Icing thermostat Refrigerant compressor	Test only possible up to approx. +30°C ambient temperature and with blower-motor switch in vehicle at position  Bring engine to approx. 3000 min ⁻¹ (until reading moves to 0).	12...15 after approx. 15...75s=0	B 15
6	6	Change-over valve - fresh air/circulated air (in R107 = main air flap)	Blower-motor switch in vehicle at position  Switch on auxiliary switch "S" on test adapter = fresh-air mode (in R 107 main air flap open)	0...3	B 17
6.1			Switch auxiliary switch "S" off again = circulated-air mode (in R 107 main air flap closed). Listen for mechanical operation when switching auxiliary switch "S" on and off.	10...15	B 19

Test step 5 deleted

A3

Rapid test chart

Mercedes-Benz W123, W126, C126, R107




A4

Rapid test chart

Mercedes-Benz W123, W126, C126, R107



Rapid test chart for electronic automatic air conditioner
Test adapter KDHK 0001 with adapter lead KDHK 0005

Test step	Rotary switch position	Test of	Test instructions	Reading/test specifications	Coordinate
7	7	Hot-water valve	Switch on auxiliary switch (S) on test adapter <u>No heating effect</u> - check by feeling	0...3	B 21
7.1			Switch off auxiliary switch (S) on test adapter <u>Heating effect</u> - check by feeling	9...14	B 23
8	8	Temperature sensor on heat exchanger	Test step to come directly after 7.1 (water in heat exchanger must be hot at start of test).	7...12 Slowly falling	C 1
11	11	Change-over valve - center nozzle flap*	- Switch on auxiliary switch (S) on test adapter Center nozzles* open - check by feeling	0...3	C 3
11.1			- Switch off auxiliary switch (S) on test adapter Center nozzles* closed - check by feeling	9...14	C 5
12	12	Change-over valve - footwell flap	- Switch on auxiliary switch (S) on test adapter Footwell flap closed - check by feeling	0...3	C 7
12.1			- Switch off auxiliary switch (S) on test adapter Footwell flap open - check by feeling	9...14	C 9
12.2		Hot-water pump	Blower-motor switch at position 		
			Switch off engine. Switch on ignition. Switch off auxiliary switch (S) on test adapter; hot-water pump operating - check by feeling/listening.	---	C 11
12.3			Switch on auxiliary switch (S) on test adapter. Hot-water pump not operating - check by feeling/listening.	---	C 13
13	13	Blower control with series resistor set	Start engine. Blower-motor switch at position "Autom." Slowly turn potentiometer (P1) on test adapter all the way from left to right: Blower speed is raised in 3 stages	---	C 15
13.1			Slowly turn potentiometer (P1) on test adapter all the way from right to left: Blower speed is lowered in 3 stages	---	C 17

* In R 107 (Europe version) = defroster nozzle flap

Test steps 9 and 10 deleted

A5

Rapid test chart

Mercedes-Benz W123, W126, C126, R107

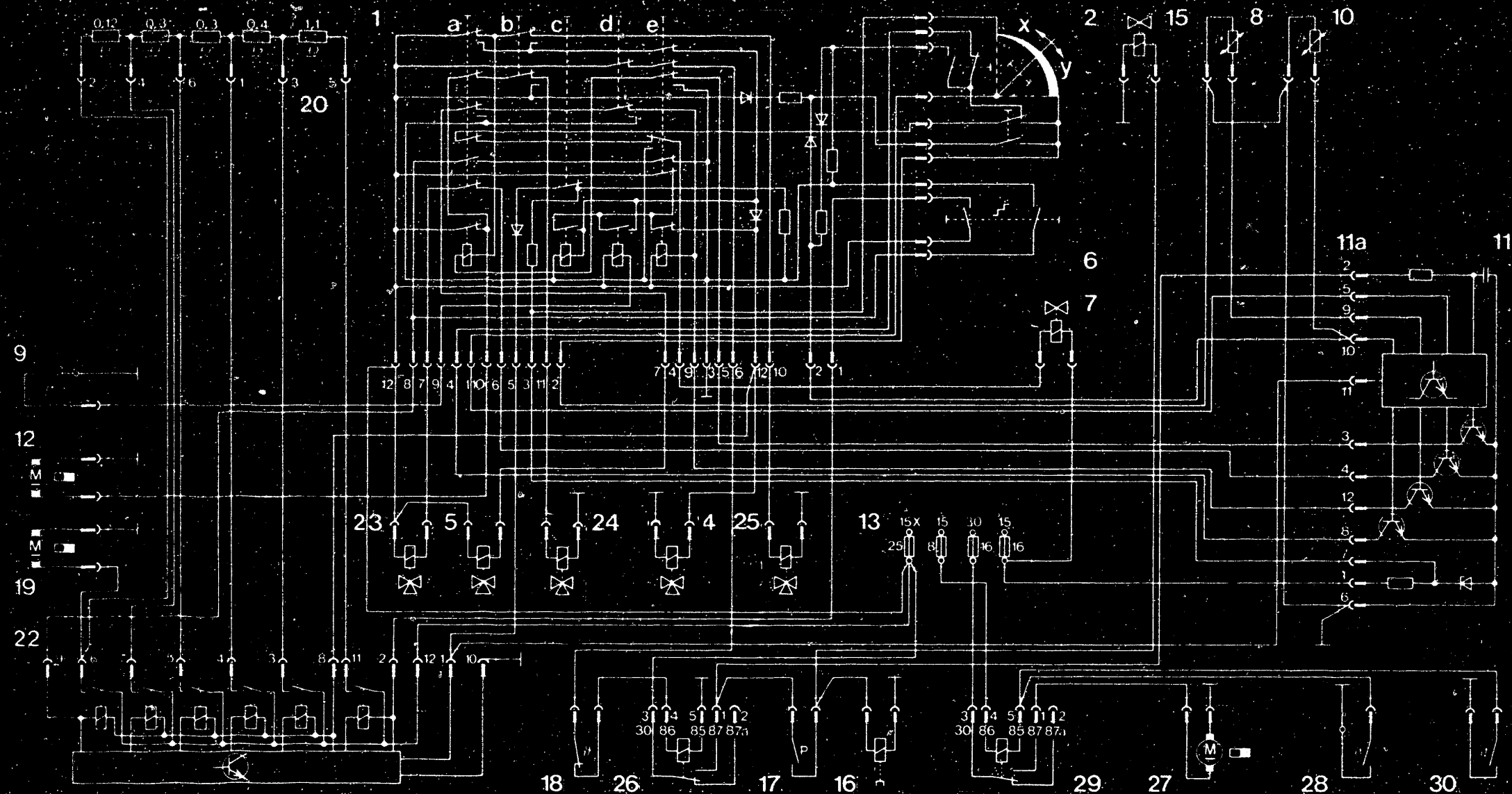


A6

Rapid test chart

Mercedes-Benz W123, W126, C126, R107





1 = Push-button switch (operator control)
a = Defrosting
b = Ventilation top/bottom
c = Normal position (air conditioner on)
d = Air conditioner off
e = Off
2 = Temperature selector thumbwheel

4 = Change-over valve - main air flap
5 = Change-over valve - fresh air/circulated air flap
6 = Blower-motor switch
7 = Hot-water valve
8 = Temperature sensor on heat exchanger
9 = Thermo-switch (cold engine disable)
10 = Passenger-compartment temperature sensor

11 = Electronic control unit (temperature controller)
12 = Hot-water pump
13 = Fuse box
15 = Change-over valve for engine-speed stabilization
16 = Compressor clutch
17 = Refrigerant compressor low-pressure switch
18 = Icing-protection switch
x = Max.
y = Min.

2. Basic circuit diagram of automatic air conditioner, vehicle type W 123

A7

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107

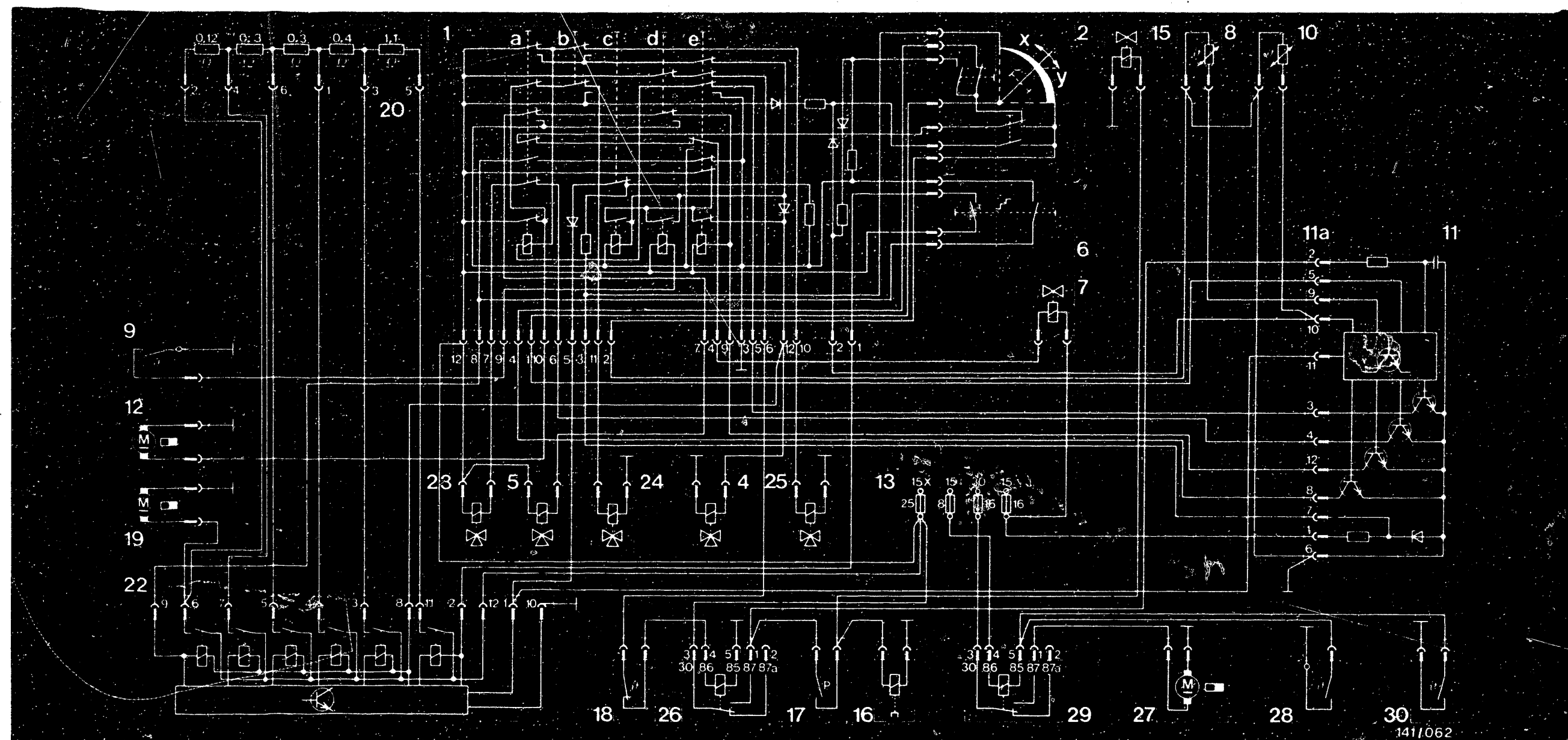


A8

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107





19 = Blower motor
 20 = Blower motor series resistor set
 22 = Electronic blower controller
 23 = Change-over valve - center nozzle flap

24 = Change-over valve - footwell flaps
 25 = Change-over valve - defroster nozzle flaps
 26 = Air conditioner relay
 27 = Auxiliary fan

28 = Auxiliary fan thermo-switch 100°C
 29 = Auxiliary fan relay
 30 = Auxiliary fan thermo-switch 62°C
 x = Max. y = Min.

2. Basic circuit diagram of automatic air conditioner, vehicle W 123 (continued)

A9

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107

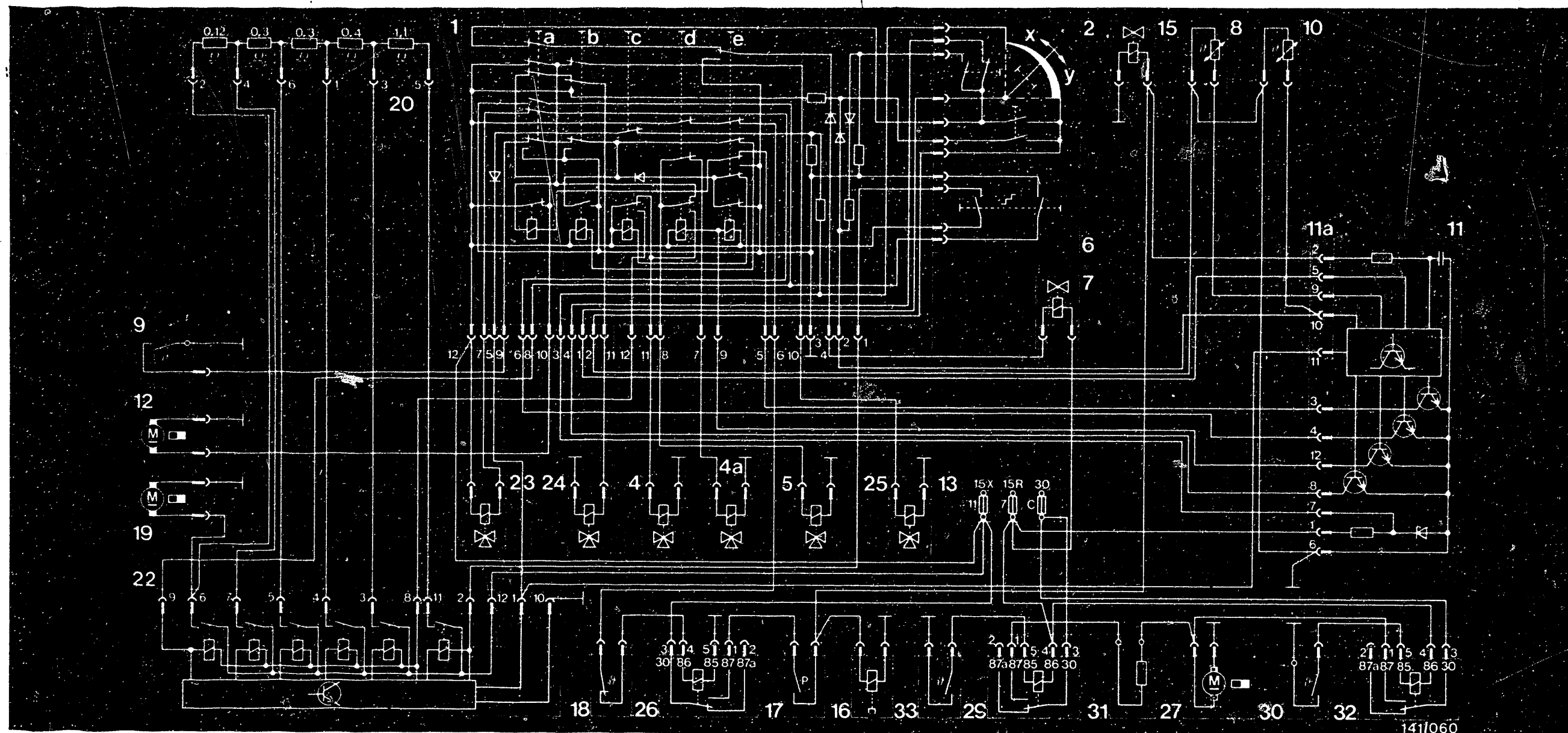


A10

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107





1 = Push-button switch (operator control)
a = Defrosting
b = Ventilation top/bottom
c = Normal position (air conditioner on)
d = Air conditioner off
e = Off
2 = Temperature selector thumbwheel

4 = Change-over valve - fresh air/circulated air switch-over and main air flap (small stroke)
4a = Change-over valve - fresh air/circulated air switch-over and main air flap (large stroke)
5 = Change-over valve for draw-off flap
6 = Blower-motor switch
7 = Hot-water valve

8 = Temperature sensor on heat exchanger
9 = Thermo-switch (cold engine disable)
10 = Passenger-compartment temperature sensor
11 = Electronic control unit (temperature controller)
12 = Hot-water pump
13 = Fuse box
x = Max.
y = Min.

2.1 Basic circuit diagram of automatic air conditioner - vehicles types W 126, C 126

A11

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107

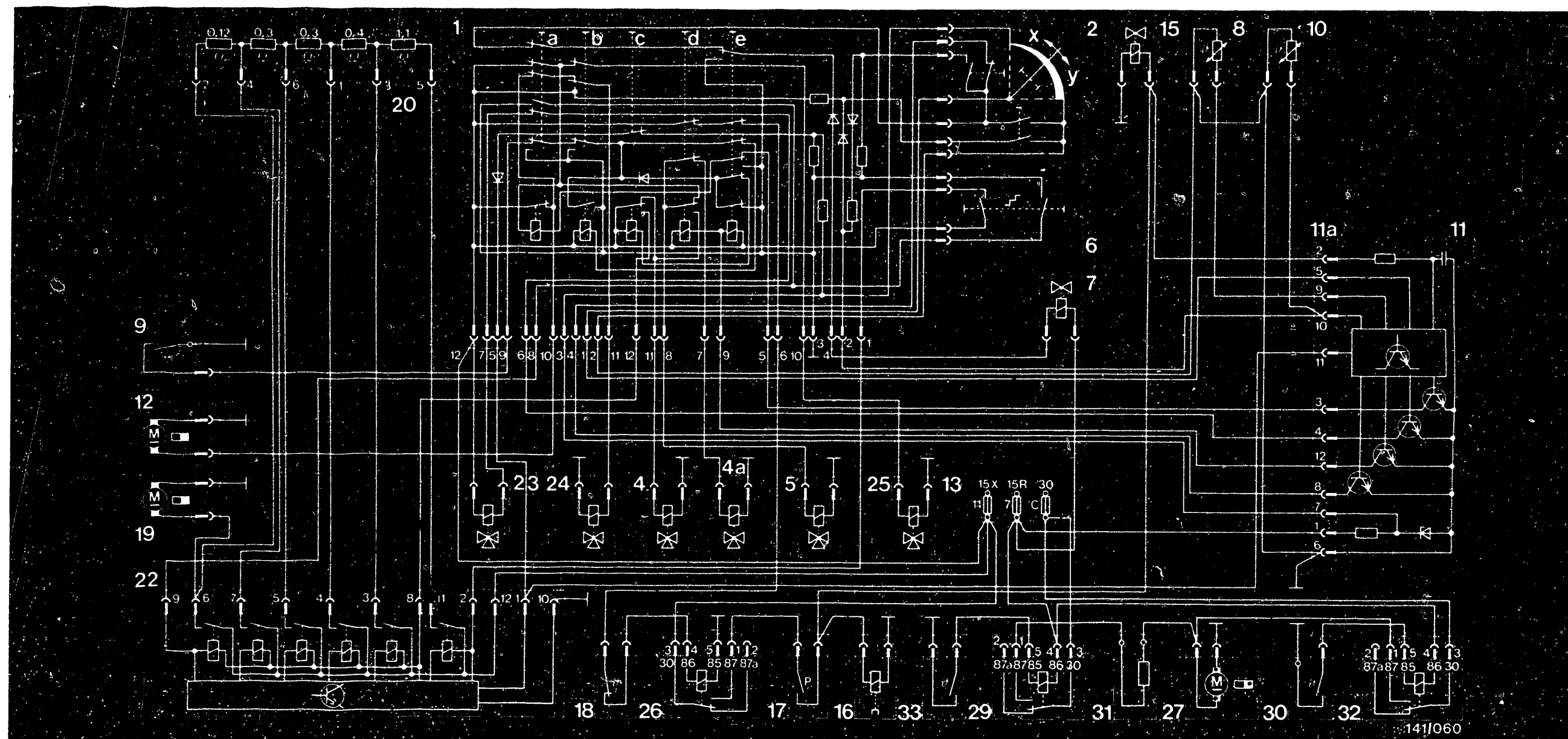


A12

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107





15 = Change-over valve for engine-speed stabilization
 16 = Compressor clutch
 17 = Refrigerant compressor pressure switch
 18 = Icing-protection switch
 19 = Blower motor
 20 = Blower motor series resistor
 22 = Electronic blower controller

23 = Change-over valve - center nozzle flap
 24 = Change-over valve - footwell flaps
 25 = Change-over valve - defroster nozzle flaps
 26 = Air conditioner relay
 27 = Auxiliary fan
 29 = Auxiliary fan relay (8-cyl. only)
 30 = Thermo-switch for auxiliary fan 100°

31 = Series resistor for auxiliary fan (8-cyl. engine only)
 32 = Auxiliary fan relay
 33 = Thermo-switch for auxiliary fan 62°
 x = Max. y = Min.

2.1 Basic circuit diagram of automatic air conditioner, vehicle types W 126, C 126 (continued)

A13

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107

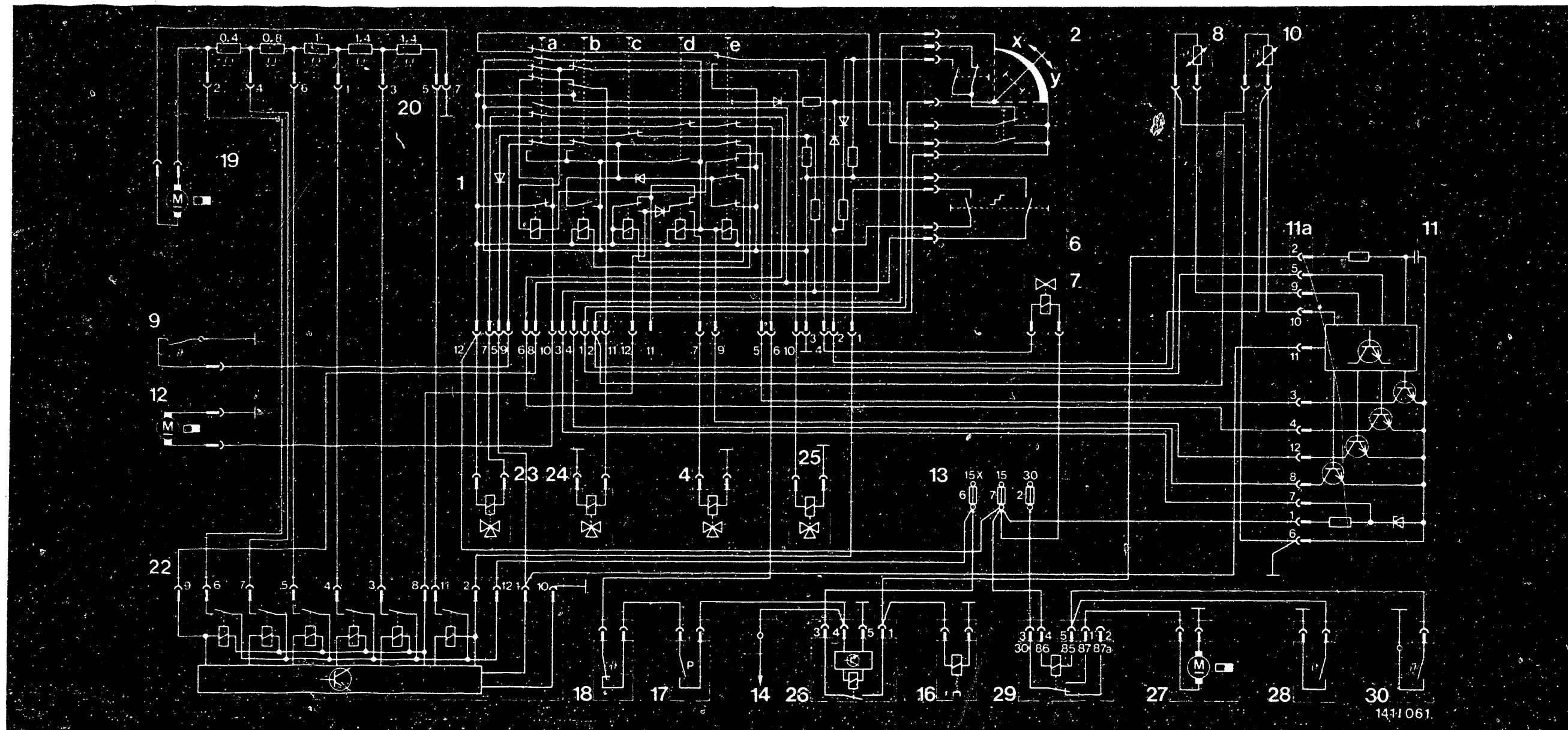


A14

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107





1 = Push-button switch (operator control)
 a = Defrosting
 b = Ventilation top/bottom
 c = Normal position (air conditioner on)
 d = Air conditioner off
 e = Off
 2 = Temperature selector thumbwheel
 4 = Change-over valve - main air flaps

6 = Blower-motor switch
 7 = Hot-water valve
 8 = Temperature sensor on heat exchanger
 9 = Thermo-switch (cold engine disable)
 10 = Passenger-compartment temperature sensor
 11 = Electronic control unit (temperature controller)
 12 = Hot-water pump
 13 = Fuse box

14 = Refrigerant compressor signal for overrun cutoff (6-cyl. engines)/idle control (8-cyl. engines)
 16 = Compressor clutch
 17 = Refrigerant compressor low-pressure switch
 18 = Icing-protection switch
 x = Max.
 y = Min.

2.2 Basic circuit diagram of automatic air conditioner, vehicle type R 107

A15

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107

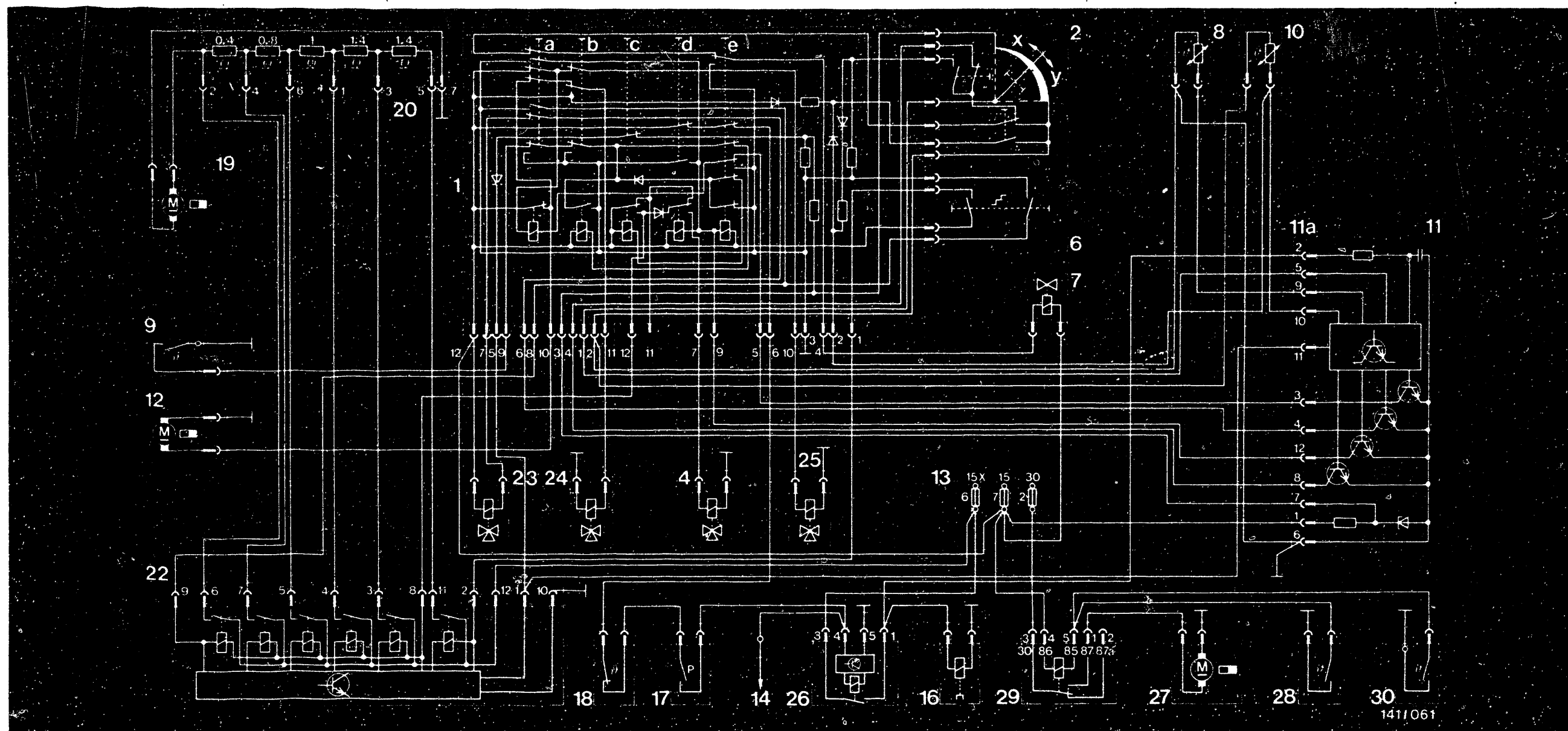


A16

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107





- 19 = Blower motor
 20 = Blower motor series resistor set
 22 = Electronic blower controller
 23 = Change-over valve - defroster nozzle flaps (small stroke)
 24 = Change-over valve - footwell flaps

- 25 = Change-over valve - defroster nozzle flaps (large stroke)
 26 = Refrigerant compressor relay, with delay
 27 = Auxiliary fan*
 28 = Auxiliary fan thermo-switch 52°*
 29 = Auxiliary fan relay*

- 30 = Thermo-switch for auxiliary fan 100°*
 x = Max. y = Min.

* = In 8-cyl. engines only

2.2 Basic circuit diagram of automatic air conditioner, vehicle R 107 (continued)

A17

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107



A18

Automatic air conditioner

Mercedes-Benz W123, W126, C126, R107



3. Testers and tools

Heating and air-conditioning test adapter	KDHK 0001
Automatic air conditioner adapter lead	KDHK 0005
Multimeter ETE 014.00	0684101 400
or e.g. Pontavi	Commercially available
Refrigerant spray	Commercially available
Extractor hook for instrument cluster	
MB Part No.:	126 589 03 33 00

4. Heating and air-conditioning test adapter KDKH 0001

The heating and air-conditioning test adapter is used for checking the peripherals of heating control/air-conditioning systems. The electronic control unit is not checked.

Construction

The test adapter is constructed so that, using the rotary switch (S1), the individual components as well as the electric leads are switched on and/or tested one after the other. Using the auxiliary switch (S), a certain component group can be checked for 2 different functions.


The potentiometer (P) is used for controlling the blower speed. Push-button (T) is not needed for the MB automatic air conditioner.

The adapter lead KDHK 0005 is used for testing the system.


5. Installation position of components

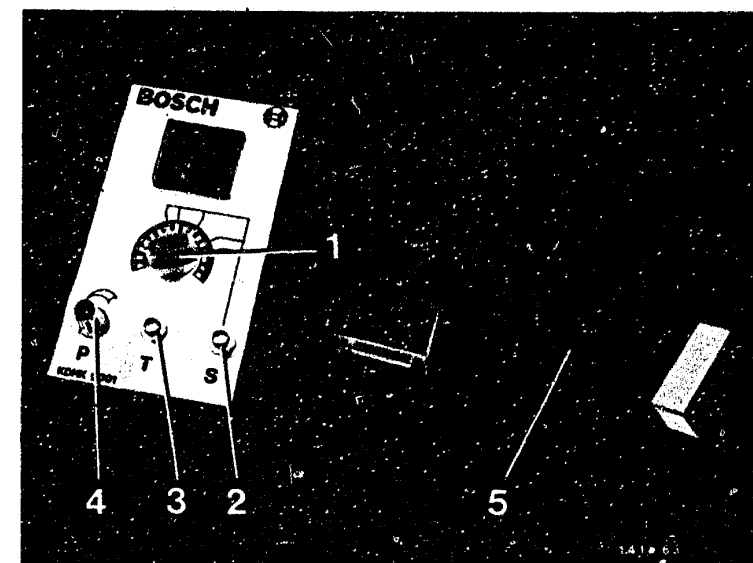
The operator control of the Mercedes-Benz automatic air conditioner (not supplied by Bosch) is in the center of the instrument panel.

The blower-motor switch symbols mean:

 = Stage 6, max. blower speed

Autom. = Stages 2-5, automatic speed control

 = Stage 1, min. blower speed



Heating and air-conditioning test adapter

- 1 = Rotary switch (S1)
- 2 = Auxiliary switch (S)
- 3 = Push-button (T)
- 4 = Potentiometer (P)
- 5 = Adapter lead for automatic air conditioner (KDHK 0005)

- 1 = Push-button switch
- 2 = Temperature selector thumbwheel
- 6 = Blower-motor switch



Installation position of components (continued)

The hot-water valve and hot-water pump are in the special equipment compartment on the right-hand side as viewed in the forward direction of travel (top picture, arrows).

The electronic control unit (temperature controller) (11) in type W 126 is mounted on the right-hand side near the glove compartment (center picture).
In types R 107 and W 123 the control unit is underneath the glove compartment (under the electronic blower controller).

The passenger-compartment temperature sensor is in the centre of the instrument panel (bottom picture). In vehicles of type W 126 manufactured as of mid 81 and type C 126 it is in the roof above the rear-view mirror.

**A21**

Installation position of components
Mercedes-Benz W123, W126, C126, R107

**A22**

Installation position of components
Mercedes-Benz W123, W126, C126, R107



Installation position of components (continued)

The temperature sensor on the heat exchanger (top picture) is in the heater box. The temperature sensor on R 107 consists of a guide tube (8a) and the sensor (8).

When removing the sensor with a screwdriver, apply the screwdriver only between the collar of the guide tube and the collar of the sensor (not between collar of guide tube and heater box since guide tube can only be properly fastened in place again by removing the entire heater box)!

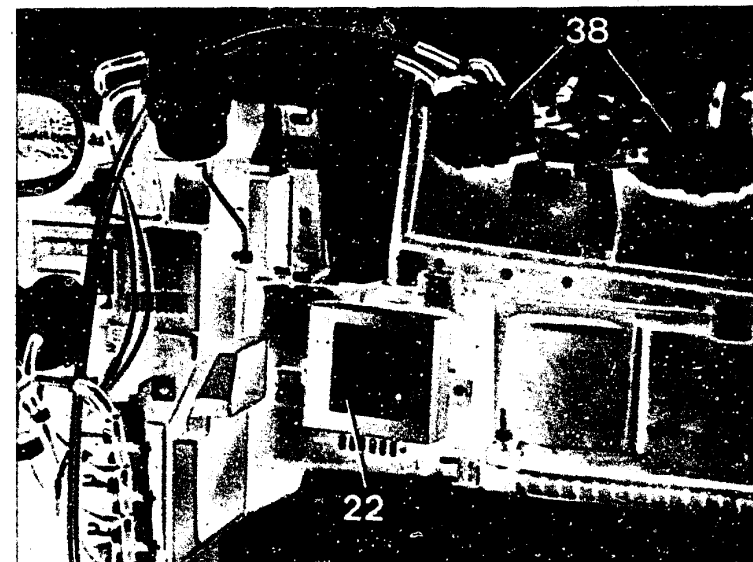
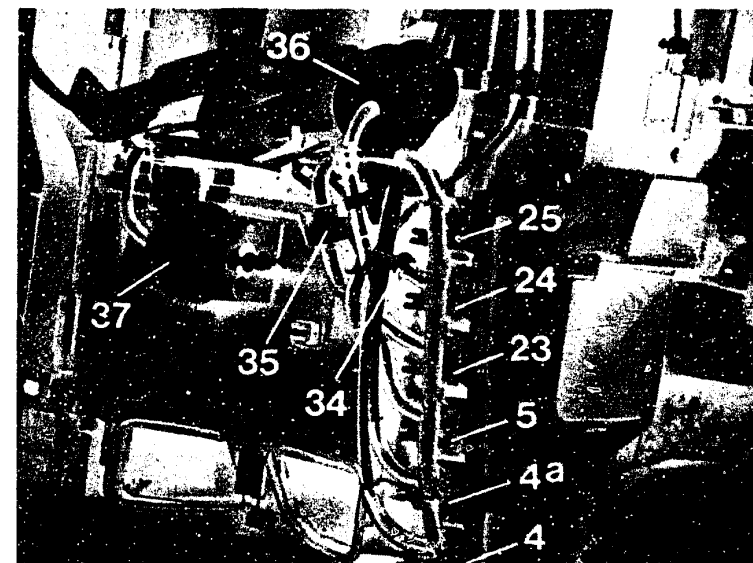
Note: The temperature sensor is only accessible after removing the center console cover (ashtray, switch and radio must be removed).

Arrangement of change-over valves and vacuum elements (center picture)

- 4 = Change-over valve for fresh air/circulated air switch-over and main air flap (small stroke)
- 4a = Change-over valve for fresh air/circulated air switch-over and main air flap (large stroke)
- 5 = Change-over valve for draw-off flap
- 23 = Change-over valve for center nozzle flap
- 24 = Change-over valve for footwell flap
- 25 = Change-over valve for defroster nozzle flaps
- 34 = Restriction
- 35 = Non-return valve
- 36 = Vacuum element for center nozzle flap
- 37 = Vacuum element for footwell nozzle flap

The electronic blower controller (22) (bottom picture) in type 126 is on the left-hand side under the glove compartment; in type 107 it is screwed onto the electronic control unit.

- 38 = Fresh air/circulated air switch-over



A23

Installation position of components
Mercedes-Benz W123, W126, C126, R107





A24

Installation position of components
Mercedes-Benz W123, W126, C126, R107



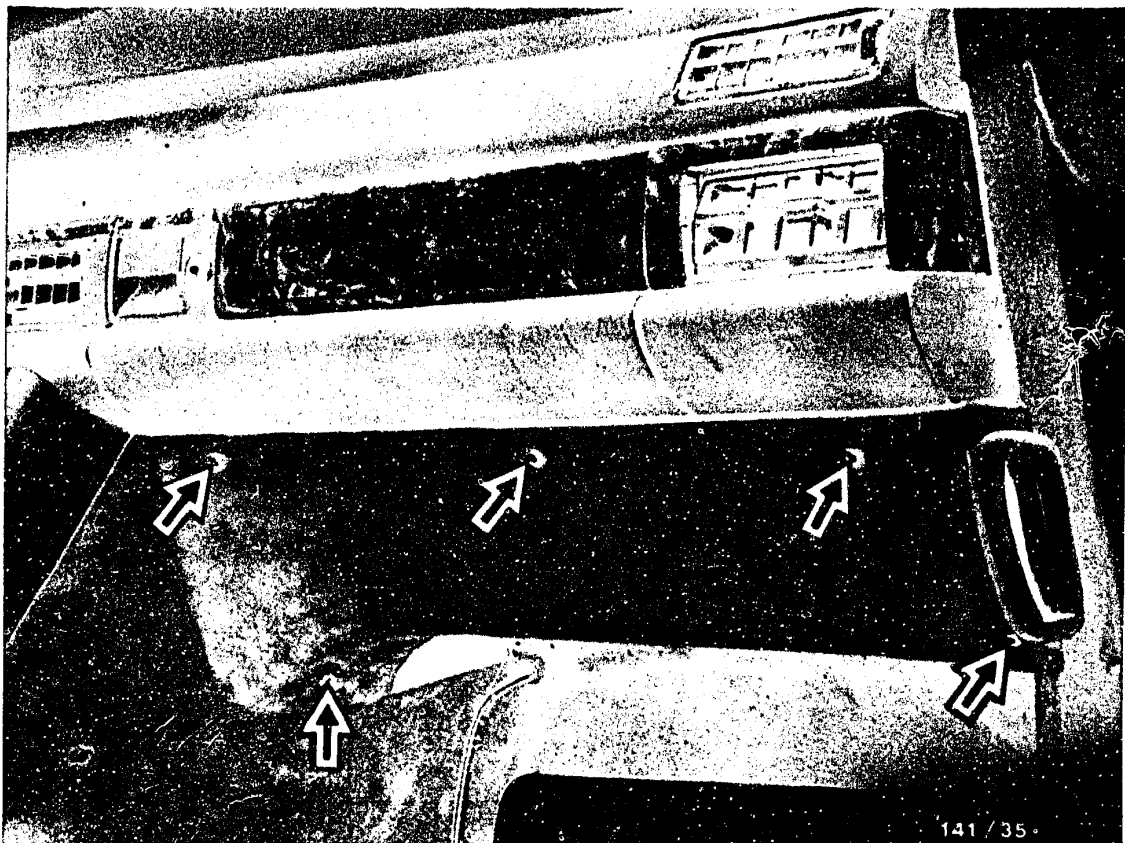
6. Trouble-shooting according to test steps

6.1 Test conditions

- Check the customer complaints
(check operation of automatic air conditioner in accordance with vehicle owner manual).
- Coolant level O.K.
- Refrigerant level O.K.
- Engine running and at normal operating temperature
- Electrical system (fuses, battery voltage) O.K.
- Blower-motor switch at position  (high)/blower operating at max. speed
- Temperature selector thumbwheel approximately in center position .(22)
- Push-button switch on vehicle in position  (normal position)
- Center nozzles mechanically open.

In the detailed trouble-shooting starting on Coordinate B 2, go through the test steps one after the other. Only if a malfunction is indicated, proceed with the trouble-shooting which is set out underneath the test steps.





6.2 Connection of adapter lead

Switch off ignition. Remove right-hand footwell panelling. To do this, loosen 5 screws (see picture, arrows). Remove control-unit plug from electronic control unit and connect to test adapter KDHK 0001 using adapter lead KDHK 0005.

Start engine.

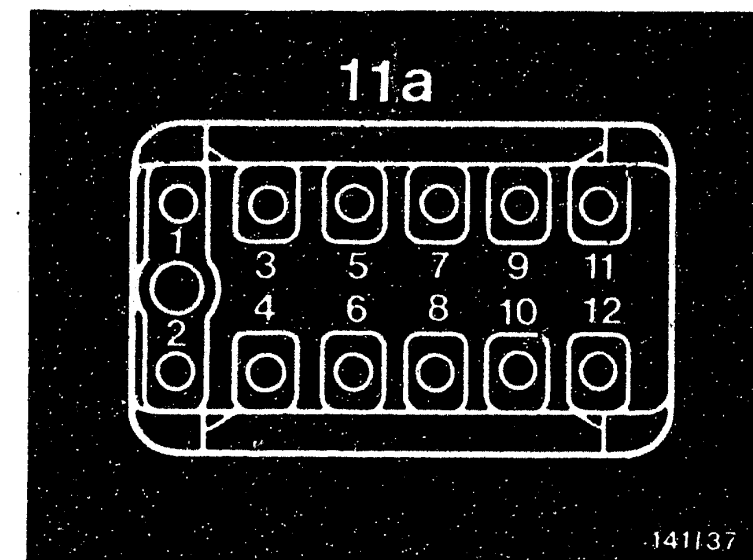
Note:

Carry out the trouble-shooting with the aid of the test chart.

If the connection between control-unit plug and adapter lead or adapter lead and test adapter becomes undone, always first of all set the rotary switch on the test adapter to "0" and switch off the ignition.



Test step: 1		Reading	Testing
Operation			
<u>Rotary switch position (S1)</u>	1		
<u>Measuring equipment:</u> Test adapter			
<u>Measuring range:</u> 0...15			
<u>Operation in vehicle:</u> Engine running			
<u>Additional operation</u>			
		On test adapter 10...15	<u>Component:</u> Power supply to electronic control unit
			<u>Operation:</u> Test power supply
			<u>Malfunction:</u> If reading less than 10 or greater than 15



11a = Control-unit plug

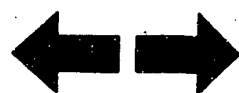
Trouble-shooting with multimeter:

Using voltmeter, test from control-unit plug (11a) pin 6 to + term. 30 and from pin 1 to ground. Reading should be approx. battery voltage. Eliminate contact resistances at plug-in connections.
If reading greater than battery voltage, alternator regulator is defective.

B3

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



B4

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



The passenger-compartment temperature sensor in vehicle types W 126 and C 126 is in the roof above the interior lamp or in the instrument panel (depending on year of manufacture). Removal and installation in the roof (top picture) is through the opening in the interior lamp.

Removal and installation in the instrument panel in type W 126 (see pictures). To do this, it is necessary to remove the instrument cluster.

Protect the instrument panel below the instrument cluster from any possible damage by taping or masking.

Disconnect the battery.

Carefully introduce the extractor hook (MB Part No. 126 589 03 33 00) at the side between instrument cluster and instrument panel with the curved section pointing downward (center picture).

Turn the extractor hook through 90° and carefully pull out until it latches into the recess on the instrument cluster (bottom picture).

Remove the instrument cluster from its mounting with the extractor hook.

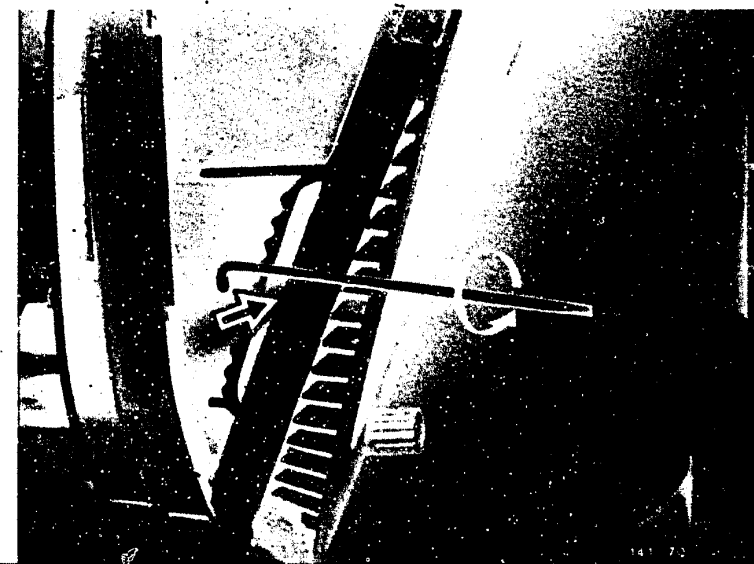
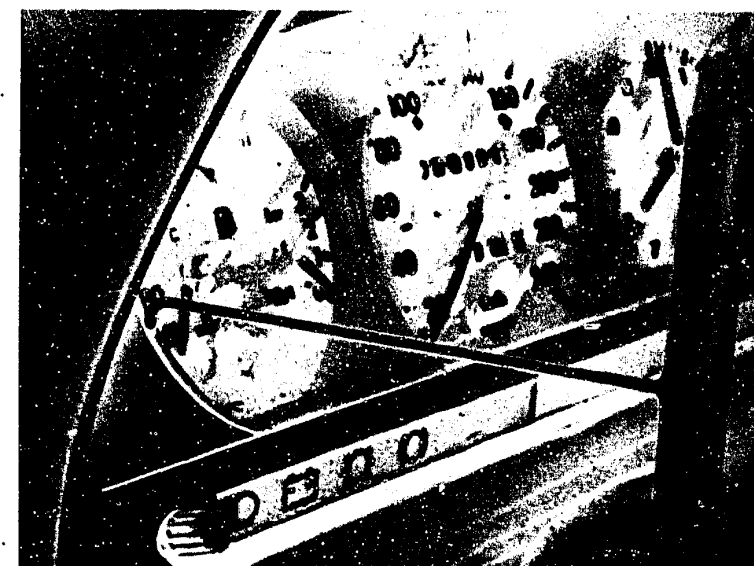
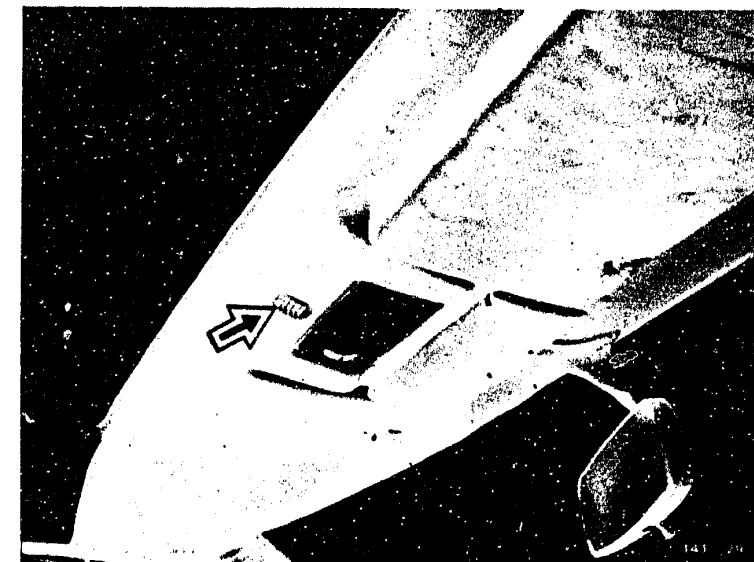
Remove the air hose and plug connector from the sensor.

Press the sensor out through the top.

The instrument cluster is held by five hooks fitted to the instrument panel.

When installing, press the instrument cluster evenly into the instrument panel.

In vehicle types W 123 and R 107 the passenger-compartment temperature sensor is in the center of the instrument panel above the center nozzles. Removal and installation is through the opening in the glove compartment. Note the installation position and assembly sequence.



B5

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



B6

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



Test step: 2		Reading	Testing
Operation			
<u>Rotary switch position (S1)</u>	2		
<u>Measuring equipment:</u> Test adapter			
<u>Measuring range:</u> 0...15			
<u>Operation in vehicle:</u> Engine running			
<u>Additional operation</u>			

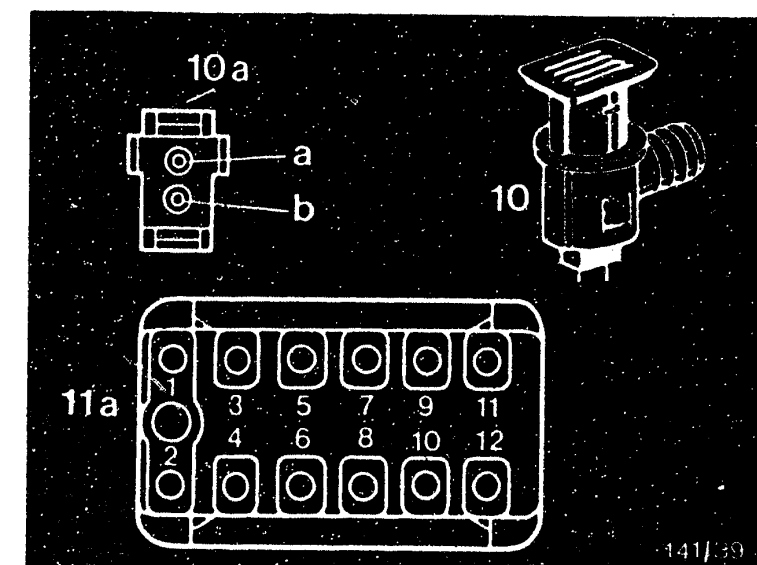
On test adapter	<u>Component:</u> Passenger-compartment temperature sensor
5...11	<u>Operation:</u> Resistance according to passenger-compartment temperature
	<u>Malfunction:</u> Reading approx. 0 or approx. 15

Trouble-shooting with multimeter:

Switch off ignition. Using ohmmeter, test the following lead for continuity. (Reading approx. 0 Ω): from plug (10a) pin a to plug (11a) pin 10, from plug (10a) pin b to plug (11a) pin 6. Test leads for short circuit: connect ohmmeter between pin 10 and pin 6 on plug (11a). Reading $\infty\Omega$. (Plug (10a) of passenger-compartment temperature sensor removed).

Test resistance of passenger-compartment temperature sensor between pins a and b on passenger-compartment temperature sensor.

Reading should be approx. 8-16 k Ω at approx. 15-30°C at temperature sensor.



- 10 = Passenger-compartment temperature sensor
- 10a = Plug for passenger-compartment temperature sensor
- 11a = Control-unit plug

B7

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107




B8

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107

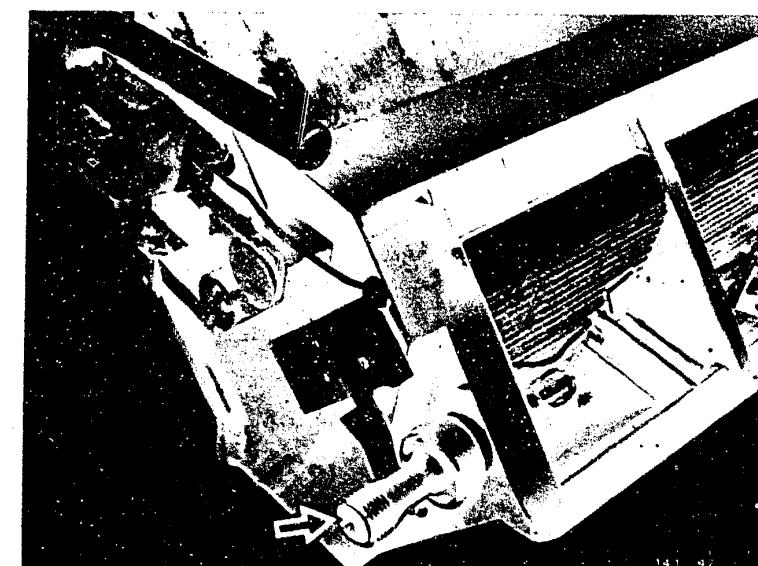


Test step: 2.2			
Operation		Reading	Testing
<u>Rotary switch position (S1)</u>	2	Paper strip is drawn onto air opening.	<u>Component:</u> Admission of air to passenger-compartment temperature sensor (air nozzle)
<u>Measuring equipment:</u> Paper strip or similar			
<u>Measuring range:</u> -			
<u>Operation in vehicle:</u> Engine running, blower-motor switch in position  (High)			<u>Operation:</u> Air being sucked in out of passenger-compartment
<u>Additional operation:</u> Hold paper strip in front of air opening (see top picture)			<u>Malfunction:</u> No air being sucked in



Trouble-shooting:

Check hose between passenger-compartment temperature sensor housing and air nozzle for leaks and security.
The "air nozzle" is fitted on the right-hand side behind the blower housing (see bottom picture, arrow).



B11

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



B12

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



Test step: 3		Reading	Testing
Operation			
Rotary switch position (S1)	3	On test adapter approx. 1.5...8.5 Min. approx. 1 Max. approx. 9 Reading must change uniformly between "min." and "max." After testing, return temperature selector thumbwheel to center position (22).	<u>Component:</u> Temperature selector thumbwheel (not supplied by Bosch)
Measuring equipment: Test adapter			<u>Operation:</u> Change of resistance
Measuring range: 0...15			<u>Malfunction:</u> Reading jumps or no reading
Operation in vehicle: Engine running			
Additional operation Turn temperature selector thumbwheel from min. to max.			

Trouble-shooting:

If reading jumps between the latch-in positions "min." and "max." = temperature selector thumbwheel defective. Replace operator control.

If no reading, check for short circuit and open circuit in lead from control-unit plug (11a) pins 5, 7 and 6 to operator control.

B 13

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107





B 14

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



Test step: 4		Reading	Testing
Operation			
<u>Rotary switch position (S1)</u>	4	On test adapter 12...15 after approx. 15...75 s reading should be approx. 0 After testing, return blower-motor switch to position 	<u>Component:</u> Refrigerant compressor icing thermostat (not supplied by Bosch) (Test only possible up to approx. + 30°C ambient temperature).
<u>Measuring equipment:</u> Test adapter			
<u>Measuring range:</u> 0...15			
<u>Operation in vehicle:</u> Engine running, blower-motor switch in position 			
<u>Additional operation</u> Bring engine to approx. 3000 min ⁻¹ (until reading moves to approx. 0).			<u>Malfunction:</u> Reading after approx. 15...75 s not approx. 0/reading = 0

Trouble-shooting:

Test the refrigerant level.

Check operation of magnetic clutch and check lead via refrigerant compressor relay and low-pressure switch.

Check lead from operator control via icing-protection switch to refrigerant compressor relay (short circuit/open circuit).

B 15

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107




B 16

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107

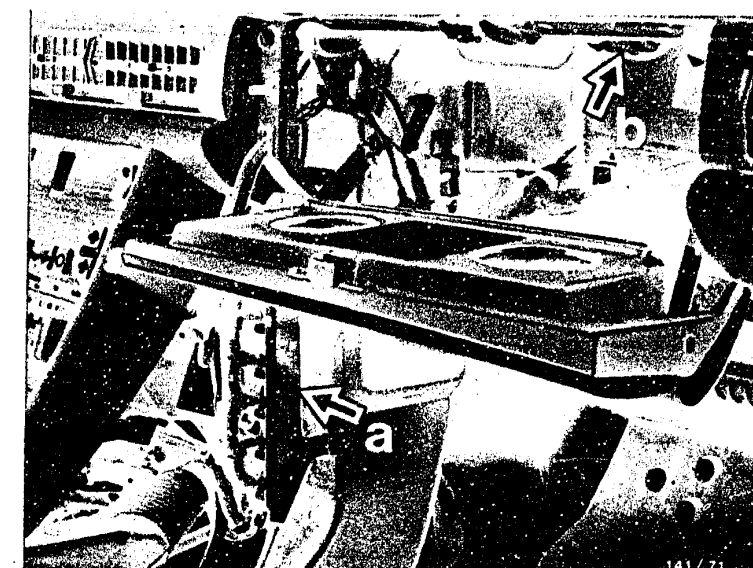


Test step: 6 (5 deleted)		Reading	Testing
Operation			
Rotary switch position (S1)	6		
<u>Measuring equipment:</u> Test adapter			
<u>Measuring range:</u> 0...15			
<u>Operation in vehicle:</u> Engine running, blower-motor switch in position 			
<u>Additional operation</u> Switch on auxiliary switch (S) on test adapter = fresh-air mode**			

On test adapter	<u>Component:</u> Change-over valve Fresh air/circulated air*
0...3	<u>Operation:</u> Change-over valve de-energized = fresh-air mode
	<u>Malfunction:</u> Voltage across change-over valve.

* On type R 107 = main air flap

** On type R 107 = main air flap open



a = Layout of change-over valves
b = Vacuum element
fresh air/circulated air

B17

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



B18

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



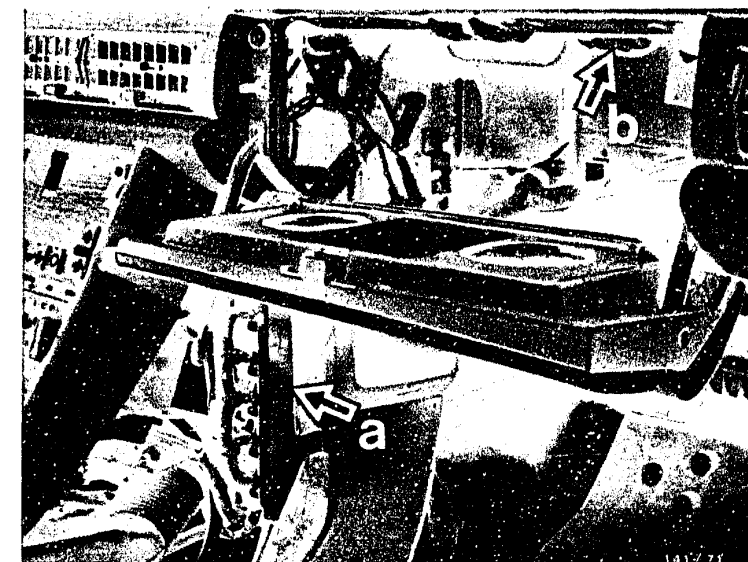
Test step: 6.1 Operation		Reading	Testing
Rotary switch position (S1)	6	On test adapter 10...15	<u>Component:</u> Change-over valve fresh air/circulated air* with lead
<u>Measuring equipment:</u> Test adapter			<u>Operation:</u> Mechanical switch-over when switching on/off the auxiliary switch (S) on test adapter
<u>Measuring range:</u> 0...15			<u>Malfunction:</u> No switch-over can be heard
<u>Operation in vehicle:</u> Engine running			
<u>Additional operation</u> Switch off auxiliary switch (S) on test adapter = circulated- air mode**			

Trouble-shooting:

Test for open circuit/short circuit in electric leads from control-unit plug pin 12 to operator control and from operator control to fresh air/circulated air change-over valve*.
Check operation of fresh air/circulated air change-over valve*.
Check operation of fresh air/circulated air vacuum element.
Test thermo-switch (cold engine disable) (closed as of approx. 33°C).
If all above tests have been carried out and are O.K., try replacing the operator control.

* On type R 107 = main air flap

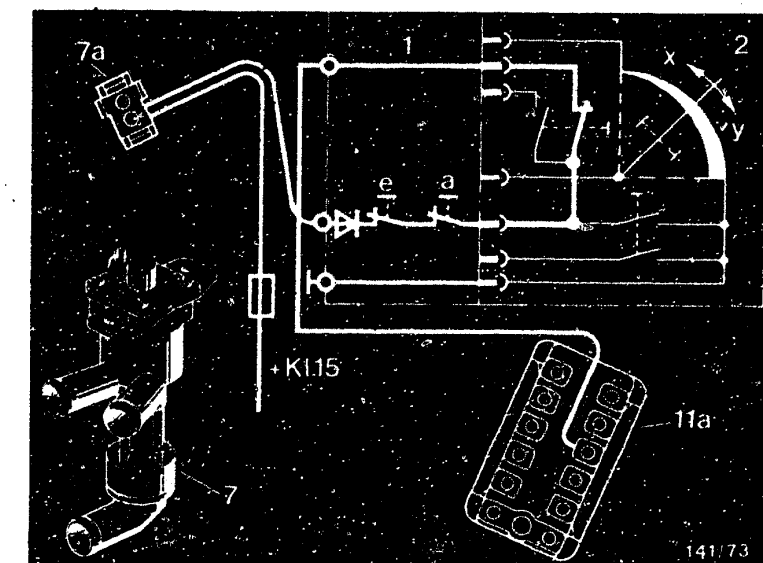
** On type R 107 = main air flap closed



a = Layout of change-over valves
b = Vacuum element
fresh air/circulated air



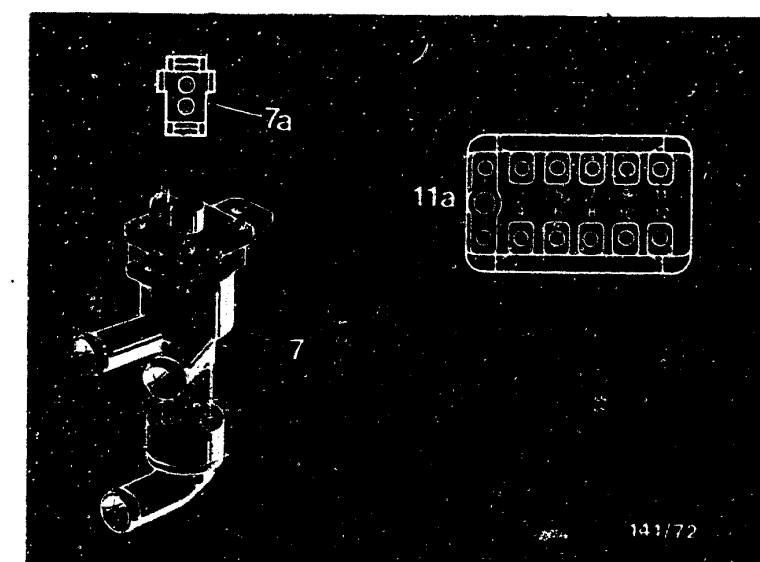
Test step: 7			
Operation		Reading	Testing
Rotary switch position (S1)	7	On test adapter	<u>Component:</u>
		0...3	Hot-water valve (open when de-energized)
<u>Measuring equipment:</u> Test adapter		Check by feeling that there is <u>no</u> heating effect.	
<u>Measuring range:</u> 0...15			<u>Operation:</u> Closing of hot-water inlet
<u>Operation in vehicle:</u> Engine running			<u>Malfunction:</u> Despite auxiliary switch "S" being pressed, there is a heating effect.
<u>Additional operation</u> Press auxiliary switch "S" on test adapter.			



- 1 = Section of operator control circuit diagram
- 2 = Temperature selector thumbwheel
- 7 = Hot-water valve
- 7a = Plug on hot-water valve
- 11a = Control-unit plug
- x = Max.
- y = Min.

Trouble-shooting with multimeter:

Switch off ignition. Using ohmmeter, test lead from control-unit plug (11a) pin 8 (through temperature selector thumbwheel, button "off" and button "defrost" to plug (7a). Reading approx. 0 Ω (temperature selector thumbwheel in position 22). Switch on ignition. Using voltmeter, test plug (7a) to ground for approx. battery voltage. Caution: connect measuring instrument correctly since in type W 126 diode is installed in operator control. If leads are O.K. and battery voltage present and still there is a heating effect, then replace hot-water valve (7) - defective.



B21

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



B22

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107

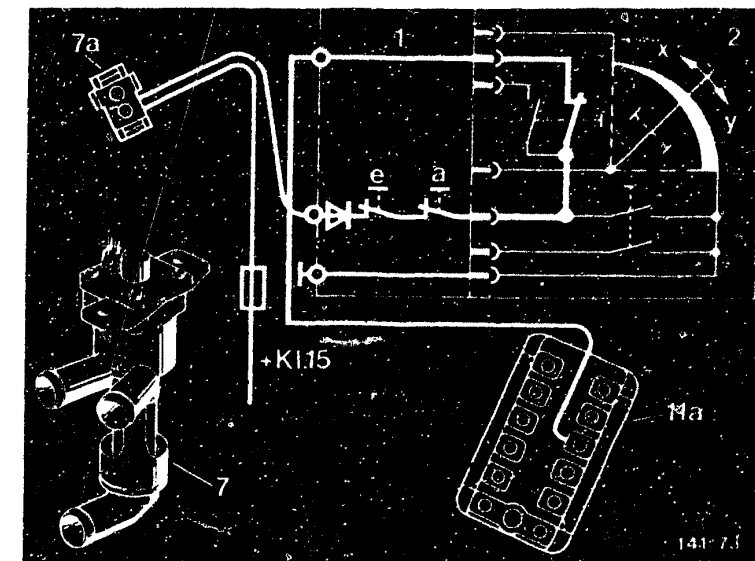


Test step: 7.1			
Operation		Reading	Testing
Rotary switch position (S1)	7	On test adapter 9...14	<u>Component:</u> Hot-water valve (open when de-energized)
<u>Measuring equipment:</u> Test adapter		Check by feeling that there is a heating <u>effect.</u>	
<u>Measuring range:</u> 0...15			<u>Operation:</u> Hot-water inlet open
<u>Operation in vehicle:</u> Engine running			
<u>Additional operation</u> Press auxiliary switch "S" on test adapter once again (un- latch).			<u>Malfunction:</u> Despite reading approx. 9...14 no heating effect

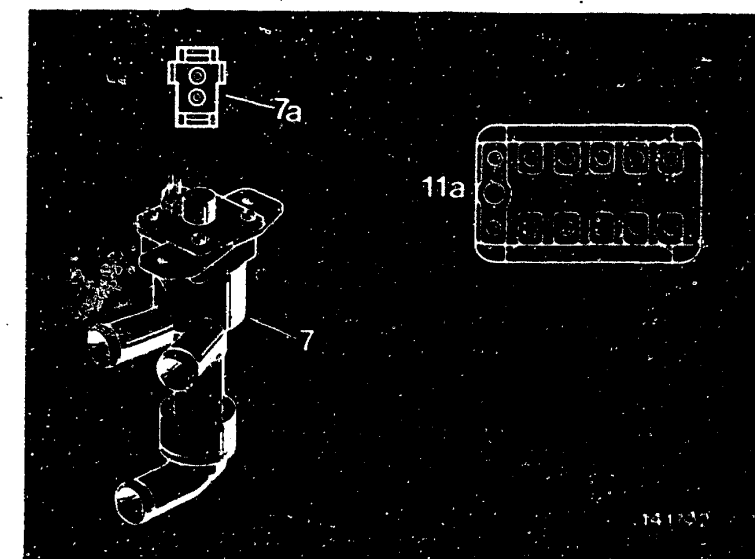
Trouble-shooting:

Despite reading approx. 9...14 no heating effect: hot-water valve electrically O.K., but mechanically defective - replace.

Note: If system only heats at low engine speed, then replace hot-water valve.



- 1 = Section of operator control circuit diagram
- 2 = Temperature selector thumbwheel
- 7 = Hot-water valve
- 7a = Plug on hot-water valve
- 11a = Control-unit plug
- x = Max.
- y = Min.



B23

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



B24

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



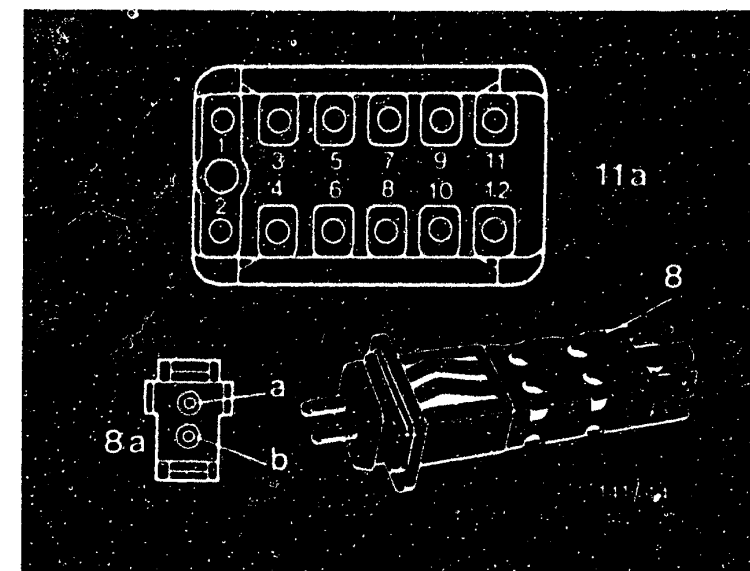
Test step: 8 must come immediately after test step 7.1!			
Operation		Reading	Testing
<u>Rotary switch position (S1)</u>	8	On test adapter 7...12 slowly falling	<u>Component:</u> Temperature sensor on heat exchanger
<u>Measuring equipment:</u> Test adapter			<u>Operation:</u> Change of resistance
<u>Measuring range:</u> 0...15			
<u>Operation in vehicle:</u> Engine running			
<u>Additional operation:</u> -			<u>Malfunction:</u> Reading approx. 0 or approx. 15, not slowly falling

Trouble-shooting with multimeter:

Ignition switched off: using ohmmeter, test the following leads for continuity (reading approx. 0 Ω): from plug (8a) pin a to control-unit plug (11a) pin 9, from plug (8a) pin b to control-unit plug (11a) pin 6.

Test leads for short circuit: connect ohmmeter to control-unit plug (11a) between pin 9 and pin 6. Reading should be $\infty\Omega$. (Plug (8a) of temperature sensor removed). Test resistance of temperature sensor: connect ohmmeter between pins. Reading should be approx. 8-16 k Ω at approx. 15-30°C at temperature sensor. Spray temperature sensor with refrigerant spray. Reading must increase. If so, temperature sensor O.K.

Note: If reading does not "fall slowly", the hot water in the heat exchanger may already have cooled down too much. In this case, turn the rotary switch (S1) on the test adapter for at least 15 seconds back to position 7 (auxiliary switch (S) unlatched). Then proceed with test step 8.



- 8 = Temperature sensor on heat exchanger
- 8a = Plug for temperature sensor on heat exchanger
- 11a = Control-unit plug

C1

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



C2

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



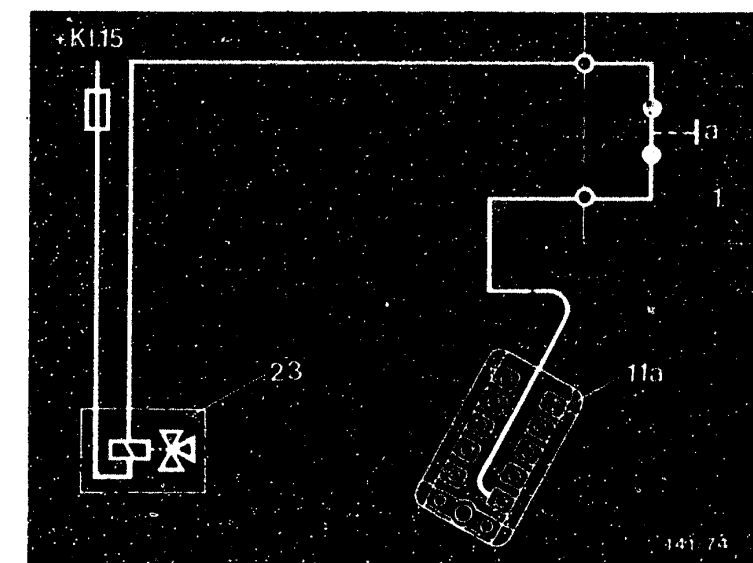
Test step: 11 (9 and 10 deleted)		Reading	Testing
Operation			
<u>Rotary switch position (S1)</u>	11	On test adapter 0...3 By feeling, check that center nozzle flaps* are open.	<u>Component:</u> Change-over valve - center nozzle flaps* (not supplied by Bosch).
<u>Measuring equipment:</u> Test adapter			
<u>Measuring range:</u> 0...15			<u>Operation:</u> Opening of center nozzle flaps*
<u>Operation in vehicle:</u> Engine running			
<u>Additional operation</u> Switch on auxiliary switch (S) on test adapter.			<u>Malfunction:</u> Center nozzle flaps* do not open

Note: Center nozzle flaps are closed when de-energized.

Trouble-shooting:

Test for short circuit/open circuit in electric lead from control-unit plug (11a) pin 4 through operator control to change-over valve for center nozzle flaps*. Check operation of change-over valve for center nozzle flaps*. Check operation of vacuum element for center nozzle flaps*.

* On type R107 Europe version = defroster nozzle flaps

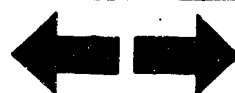


- a = Push-button for defrosting
- 1 = Operator control
- 11a = Control-unit plug
- 23 = Change-over valve - center nozzle flaps

C3

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



C4

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



Test step: 11.1		
Operation		Reading
Rotary switch position (S1)		On test adapter
		9...14
Measuring equipment: Test adapter		By feeling, check that center nozzle flaps* are closed.
Measuring range: 0...15		
Operation in vehicle: Engine running		
Additional operation Switch off auxiliary switch (S) on test adapter.		
		Testing
		Component:
		Change-over valve - center nozzle flaps* (not supplied by Bosch)
		Operation:
		Closing of center nozzle flaps*
		Malfunction:
		Center nozzle flaps* do not close.

Note: Center nozzle flaps are closed when de-energized.

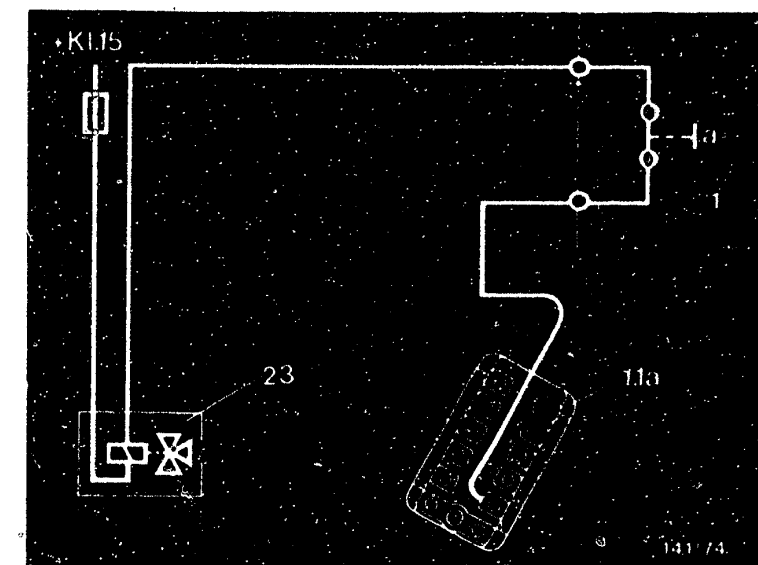
Trouble-shooting:

Check operation of change-over valve for center nozzle flaps.

Check operation of vacuum element for center nozzle flaps.

Check mechanical operation of center nozzle flaps.

* On type R107 Europe version = defroster nozzle flaps



- a = Push-button for defrosting
- 1 = Operator control
- 11a = Control-unit plug
- 23 = Change-over valve - center nozzle flaps

C5

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



C6

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



Test step: 12		Reading	Testing
Operation			
<u>Rotary switch position (S1)</u>	12	On test adapter 0...3 By feeling, check that footwell flap is closed.	<u>Component:</u> Change-over valve for footwell flap (not supplied by Bosch)
<u>Measuring equipment:</u> Test adapter			
<u>Measuring range:</u> 0...15			
<u>Operation in vehicle:</u> Engine running			
<u>Additional operation</u> Switch on auxiliary switch (S) on test adapter.			
			<u>Operation:</u> Opening and closing of footwell flap.
			<u>Malfunction:</u> Footwell flap not closed.

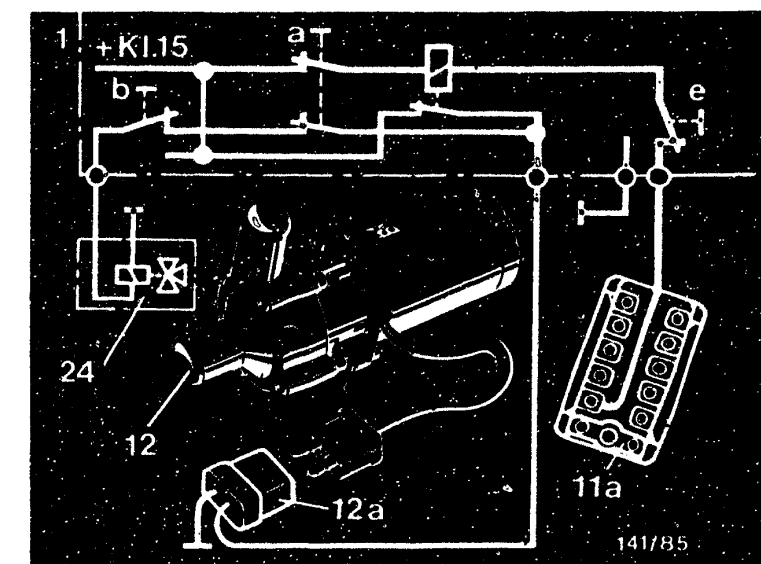
Note: Footwell flap is open when lead from control-unit plug (11a) pin 3 to operator control is dead.

Trouble-shooting:

Test for open circuit in electric lead from control-unit plug (11a) pin 3 to operator control.

Check operation of change-over valve and vacuum element for footwell flap.

Try replacing operator control.



- a = Push-button - defrost
- b = Push-button - ventilation top/bottom
- e = Push-button off
- 1 = Section of operator control circuit diagram
- 11a = Control-unit plug
- 12 = Hot-water pump
- 12a = Plug on hot-water pump
- 24 = Change-over valve - footwell flaps

C7

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



C8

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



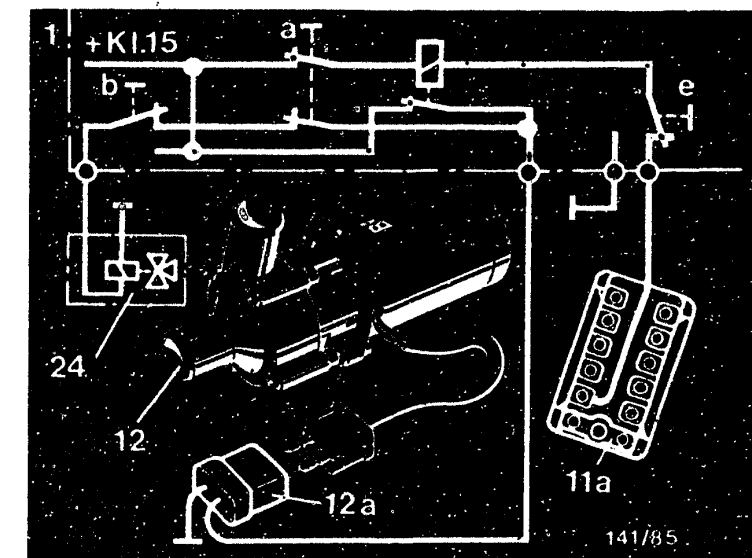
Test step: 12.1		Reading	Testing
Operation			
Rotary switch position (S1)	12	On test adapter 9...14 By feeling, check that footwell flap is open.	<u>Component:</u> Change-over valve for footwell flap (not supplied by Bosch).
<u>Measuring equipment:</u> Test adapter			
<u>Measuring range:</u> 0...15			
<u>Operation in vehicle:</u> Engine running			
<u>Additional operation</u> Switch off auxiliary switch (S) on test adapter.		<u>Malfunction:</u> Footwell flap does not open	

Note: Footwell flap is open when lead from control-unit plug (11a) pin 3 to operator control is dead.

Trouble-shooting:

Test for open circuit in electric lead from operator control to change-over valve for footwell flap. Try replacing operator control.

Check operation of change-over valve and vacuum element for footwell flap.



- a = Push-button - defrost
- b = Push-button - ventilation top/bottom
- e = Push-button off
- 1 = Section of operator control circuit diagram
- 11a = Control-unit plug
- 12 = Hot-water pump
- 12a = Plug on hot-water pump
- 24 = Change-over valve - footwell flaps

C9

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



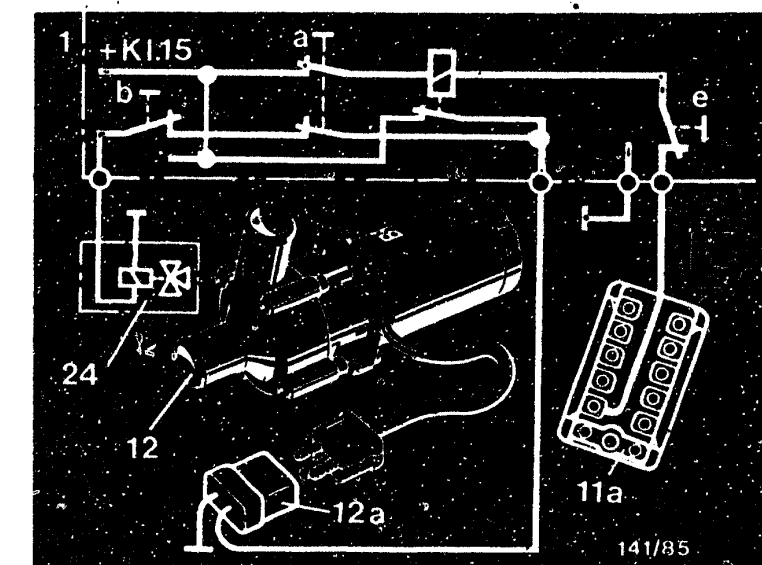
C10

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



Test step: 12.2		
Operation		Reading
Rotary switch position (S1)	12	On test adapter -----
Measuring equipment: Test adapter		By feeling/listening, check that hot-water pump is operating.
Measuring range: 0...15		
Operation in vehicle: Switch off engine Switch on ignition Blower-motor switch in position		
Additional operation: Switch off auxiliary switch (S) on test adapter.		<p>Operation: High hot-water throughflow even at low engine speed</p> <p>Malfunction: Hot-water pump not operating</p>



- a = Push-button - defrost
- b = Push-button - ventilation top/
bottom
- e = Push-button off
- 1 = Section of operator control
circuit diagram
- 11a = Control-unit plug
- 12 = Hot-water pump
- 12a = Plug on hot-water pump
- 24 = Change-over valve - footwell
flaps

Trouble-shooting with multimeter:

Using voltmeter, test plug (12a) to ground for approx. battery voltage. Switch off ignition. Using ohmmeter, test lead from operator control pin 10 to plug on hot-water pump. Reading approx. 0 Ω . Test lead for short circuit. Eliminate any open circuit/contact resistances at plug-in connections. Check operation of hot-water pump. Try replacing operator control.

C11

Trouble-shooting


Mercedes-Benz W123, W126, C126, R107


C12

Trouble-shooting

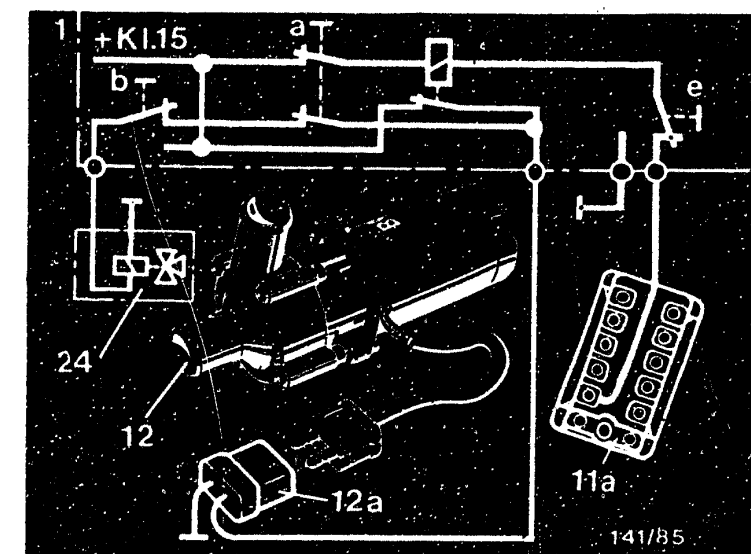
Mercedes-Benz W123, W126, C126, R107



Test step: 12.3			
Operation		Reading	Testing
<u>Rotary switch position (S1)</u>	12	On test adapter ----- By feeling/listening, check that hot-water pump is <u>not operating</u> .	<u>Component:</u> Hot-water pump
<u>Measuring equipment:</u> Test adapter			<u>Operation:</u> No high hot-water throughflow at low engine speed
<u>Measuring range:</u> 0...15			
<u>Operation in vehicle:</u> Switch off engine Switch on ignition Blower-motor switch in position 			<u>Malfunction:</u> Hot-water pump operating
<u>Additional operation</u> Switch on auxiliary switch (S) on test adapter.			

Trouble-shooting with multimeter:

Test for damage to electric lead from operator control to plug (12a) on hot-water pump (12). Try replacing operator control (1).

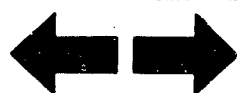


- a = Push-button - defrost
- b = Push-button - ventilation top/
bottom
- e = Push-button off
- 1 = Section of operator control
circuit diagram
- 11a = Control-unit plug
- 12 = Hot-water pump
- 12a = Plug on hot-water pump
- 24 = Change-over valve - footwell
flaps

C13

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



C14

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



Test step: 13		Reading	Testing
Operation			
<u>Rotary switch position (S1)</u>	13	On test adapter ----- Blower speed is raised in 3 stages	<u>Component:</u> Blower control with series resistor set
<u>Measuring equipment:</u> Test adapter			
<u>Measuring range:</u> 0...15			
<u>Operation in vehicle:</u> Engine running Blower-motor switch in position "Autom."			
<u>Additional operation</u> Slowly turn potentiometer (P1) on test adapter all the way from left to right.			<u>Malfunction:</u> Blower speed is not raised.

Trouble-shooting with multimeter:

Test for damage/open circuit in electric lead from control-unit plug (11a) pin 11 to electronic blower controller (22) pin 1.

Using voltmeter, test electronic blower controller (22) pin 12 (+) and pin 10 (-) for approx. battery voltage.

Check operation of series resistor set (not supplied by Bosch) and of blower motor.

Series resistor set in type W123 is in engine compartment on wheel house, in W126 and C126 in special equipment compartment underneath brake booster, and in type R107 next to the blower motor.

Try replacing operator control/electronic blower controller.

C15

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



C16

Trouble-shooting

Mercedes-Benz W123, W126, C126, R107



Test step: 13.1		Reading	Testing
Operation			
<u>Rotary switch position (S1)</u>	13	On test adapter ----- Blower speed is lowered in 3 stages	<u>Component:</u> Blower control with series resistor set
<u>Measuring equipment:</u> Test adapter			<u>Operation:</u> Blower speed control
<u>Measuring range:</u> 0...15			
<u>Operation in vehicle:</u> Engine running Blower-motor switch in position "Autom."			<u>Malfunction:</u> Blower speed is not lowered.
<u>Additional operation</u> Slowly turn potentiometer (P1) on test adapter all the way from right to left.			

Try replacing electronic blower controller.



Set rotary switch (S) on test adapter to "0".

Switch off ignition.

Remove adapter lead KDHK 0005 from control-unit plug.

If no fault has been found on the individual components by testing the automatic air conditioner with the test adapter, but the automatic air conditioner is still malfunctioning, try replacing the electronic control unit and the operator control.

Plug the control-unit plug onto the electronic control unit. Then re-check the system according to the vehicle owner manual.

Then re-install the right-hand footwell panelling.



Table of contents

<u>Section</u>	<u>Coordinate</u>
Microfiche layout.....	A 1
1. Rapid test chart.....	A 2 .
2. Basic circuit diagram of automatic air conditioner W 123.....	A 7
2.1 Basic circuit diagram of automatic air conditioner W 126, C126.....	A 11
2.2 Basic circuit diagram of automatic air conditioner R 107.....	A 15
3. Testers and tools.....	A 19
4. Heating and air-conditioning test adapter.....	A 19
5. Installation position of components...	A 19
6. Trouble-shooting according to test steps.....	B 1

© 1982 Robert Bosch GmbH
Automotive Equipment - After-Sales Service
Department for Technical Publications KH/VDT,
Postfach 50, D-7000 Stuttgart 1

Published by: After-Sales Service Department for
Training and Technology (KH/VSK). Press date: 6.1982.

Please direct questions and comments concerning the
contents to our authorized representative in your
country.

This publication is only for the use of the Bosch
After-Sales Service Organization, and may not be passed
on to third parties without our consent.

Microfilmed in the Federal Republic of Germany. Micro-
photographié en République Fédérale d'Allemagne par
Robert Bosch GmbH

